

10/534140

IN THE IPEA/ER 1006 Rec'd PCT/PTO 06 MAY 2005

International Application No.: PCT/US02/35757	International Filing Date: 07/11/2002	Priority Date Claimed: 07/06/2001
Title of Invention <b>DUAL-CELL MECHANICAL FLOTATION SYSTEM WITH INTERMITTENT SKIMMING</b>		
Applicant <b>PETRECO INTERNATIONAL LIMITED</b>	PCT Chapter II	
Agent's File Reference: <b>PET-1005PCT</b>	Date: 29 January 2003	

AMENDMENT UNDER RULE 34

34

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Dear Sir or Madam:

CLAIM REPLACEMENT PAGES

Please enter the following replacement pages for the claims, pages numbered 14 through 18.

On substitute page 14, in original claim 1, lines 16-17, the item g) "a controller; and ... the vessel" was moved to the end of the claim (now lines 20-21) and renumbered item h) and preceded by the words "characterized in that the apparatus further comprises" in new line 19. The word "and" was deleted. Additionally, the original item h) "an outlet ... discharge chamber" was renumbered item g).

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JANUARY 29, 2003  
Date of Deposit

David L. Mossman 01-29-2003  
David L. Mossman  
Date

On substitute page 16, in claim 6, the words "characterized in that the apparatus further comprises" have been added in line 25 after item j) "at least one ... the vessel" and before item k) "a control mechanism ... the vessel".

On substitute page 17, in claim 9, original lines 16-17, the item e) "intermittently raising ... collection channel; and" was moved to the end of the claim (now lines 18-19) and renumbered item f) and preceded by the words "characterized in that the apparatus further comprises:" in line 17. The word "and" was deleted. Additionally, the original item f) "removing clarified liquid ... discharge chamber" was renumbered item e).

The claims in the present application are 1 through 18.

#### REMARKS

The Applicant has revised the claims to highlight the controller for regulating the height of the liquid level in response to the movement of the vessel in claim 1, to highlight the control mechanism for controlling the height of the liquid level in response to the movement of the vessel in claim 6, and to highlight intermittently raising the liquid level and collecting suspended matter in the primary skim collection channel in claim 9.

These amendments are being made within two months of the date of December 2, 2002 when the International Searching Authority received the search copy of the international application, and are thus timely made.

It is respectfully submitted that the invention as recited in the amended claims is novel and demonstrates an inventive step from the teachings of all of the references whether taken separately or allegedly in combination.

Substantive examination and consideration of all of the claims is respectfully requested in view of these amendments to the claims. Detailed substantive examination of the claims is specifically and respectfully requested, including specific reasons for the opinions provided by the Examiner.

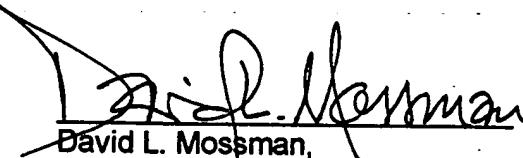
Please continue to direct all communications as follows:

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UNITED STATES OF AMERICA**

The Applicant invites the Examiner to call the Applicant's agent at the number below for any reason that would help advance the prosecution.

An appointment of the undersigned as sub-agent signed by the attorney of record Michael J. Brown is enclosed.

Respectfully submitted,  
**PETRECO INTERNATIONAL LIMITED,**

  
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01-29-2003  
Date

Claims

We Claim:

1. In an apparatus for removing suspended matter from a liquid, the apparatus comprising:
  - a) a vessel for receiving a flow of liquid having suspended matter therein;
  - b) a plurality of partitions sequentially dividing the vessel into an inlet chamber, at least a first gasification chamber and a second gasification chamber, and an outlet chamber, each adjacent chamber fluidly communicating with one another;
  - c) a discharge chamber having a fluid communication with the outlet chamber;
  - d) an inlet to introduce the flow of liquid into the inlet chamber;
  - e) a mechanism for ingesting and mixing gas into the liquid of each gasification chamber for creating a turbulent area and for attracting the suspended matter and for carrying the suspended matter to an upper portion of the vessel, the interface of the gas and liquid being a liquid level;
  - f) a primary skim collection channel extending at least partially along the top of the partition between the first gasification chamber and the second gasification chamber for collecting suspended matter in the upper portion of both gasification chambers; and
  - g) an outlet for removing clarified liquid from the discharge chamber;characterized in that the apparatus further comprises:
  - h) a controller for regulating the height of the liquid level in response to the movement of the vessel.
2. The apparatus of claim 1 further comprising a control mechanism for controlling the liquid level in the first and second gasification chambers by regulating flow through a valve in the fluid communication between the outlet chamber and the discharge chamber.
3. The apparatus of claim 1 further comprising a control mechanism for controlling the liquid level in the discharge chamber by regulating flow through a valve in the

outlet from the discharge chamber.

4. The apparatus of claim 1 further comprising:
  - j) at least one baffle near the primary skim collection channel to dampen motion of the liquid caused by movement of the vessel.
5. The apparatus of claim 4 where the vessel has a horizontal plane and where the baffle j) extends inwardly into the vessel from an interior top surface thereof to a lowermost distal edge, where a line between an upper edge of the primary skim collection channel and the distal edge of the baffle j) forms an angle with the horizontal plane of between 5 and 15°.

1    6. In an apparatus for removing suspended matter from a liquid, the apparatus  
2    comprising:  
3    a) a vessel for receiving a flow of liquid having suspended matter therein;  
4    b) a plurality of partitions sequentially dividing the vessel into an inlet chamber, at  
5    least a first gasification chamber and a second gasification chamber, and an  
6    outlet chamber, each adjacent chamber fluidly communicating with one  
7    another;  
8    c) a discharge chamber having a fluid communication with the outlet chamber;  
9    d) an inlet to introduce the flow of liquid into the inlet chamber;  
10   e) a mechanism for ingesting and mixing gas into the liquid of each gasification  
11   chamber for creating a turbulent area and for attracting the suspended matter  
12   and for carrying the suspended matter to an upper portion of the vessel, the  
13   interface of the gas and liquid being a liquid level;  
14   f) a primary skim collection channel extending at least partially along the top of  
15   the partition between the first gasification chamber and the second gasification  
16   chamber for collecting suspended matter in the upper portion of both  
17   gasification chambers;  
18   g) a secondary skim collection channel, independent of the primary channel,  
19   located in the upper portion of the inlet chamber;

20        h) a tertiary skim collection channel, independent of the primary and secondary  
21        channels, located in the upper portion of the discharge chamber;  
22        i) an outlet for removing clarified liquid from the discharge chamber; and  
23        j) at least one baffle near the primary skim collection channel to dampen motion  
24        of the liquid caused by movement of the vessel;  
25        characterized in that the apparatus further comprises:  
26        k) a control mechanism for controlling height of the liquid level in response to the  
27        movement of the vessel.

7. The apparatus of claim 6 further comprising a control mechanism for controlling the liquid level in the first and second gasification chambers by regulating flow through a valve in the fluid communication between the outlet chamber and the discharge chamber.

8. The apparatus of claim 6 where the vessel has a horizontal plane and where the baffle j) extends inwardly into the vessel from an interior top surface thereof to a lowermost distal edge, where the line between an upper edge of the primary skim collection channel and the distal edge of the baffle j) forms an angle with the horizontal plane of between 5 and 15°.

1        9. In a method for clarifying liquid from suspended matter, the method comprising:  
2        a) providing a vessel having a plurality of partitions sequentially dividing the  
3        vessel into an inlet chamber, at least a first gasification chamber and a second  
4        gasification chamber, and an outlet chamber, each adjacent chamber fluidly  
5        communicating with one another, and a discharge chamber in fluid  
6        communication with the outlet chamber;  
7        b) introducing a flow of liquid having suspended matter into the inlet chamber  
8        through an inlet;  
9        c) introducing a flow of gas into each of the first and the second gasification  
10        chambers for creating a turbulent area, and for allowing the gas to attract the  
11        suspended matter and carry it to an upper portion of the vessel, the interface of  
12        the gas and liquid being a liquid level;

13       d) maintaining the liquid level below a primary skim collection channel extending  
14       at least partially along the top of the partition between the first gasification  
15       chamber and the second gasification chamber and  
16       e) removing clarified liquid from the discharge chamber;  
17       characterized in that the method further comprises:  
18       f) intermittently raising the liquid level and collecting suspended matter in the  
19       primary skim collection channel.

10. The method of ~~claim 9~~ further comprising controlling the liquid level in the first  
and second gasification chambers by regulating flow through a valve in the fluid  
communication between the outlet chamber and the discharge chamber.

11. The method of ~~claim 9~~ further comprising controlling the liquid level in response  
to the movement of the vessel.

12. The method of ~~claim 9~~ further comprising controlling the liquid level in response  
to the pitch or roll of the vessel.

13. The method of ~~claim 9~~ further comprising controlling the liquid level in the  
discharge chamber by regulating flow through a valve in an outlet from the  
discharge chamber.

14. The method of ~~claim 9~~ further comprising:  
g) dampening the motion of the liquid near the primary skim collection channel  
with at least one baffle.

15. The method of ~~claim 14~~ where g) dampening the motion of the liquid near the  
primary skim collection channel is accomplished with at least one baffle extending  
inwardly into the vessel from an interior top surface thereof, the baffle having a  
lowermost distal edge, where a line between an upper edge of the primary skim  
collection channel and the distal edge of the baffle, forms an angle with a horizontal

plane of the vessel of between 5 and 15°.

16. The method of claim 9 where the residence time for each gasification chamber is between 2.0 and 2.5 minutes.
17. The method of claim 9 further comprising collecting suspended matter in a secondary skim collection channel, independent of the primary channel, located in the upper portion of the inlet chamber.
18. The method of claim 17 further comprising collecting suspended matter in a tertiary skim collection channel, independent of the primary and secondary channels, located in the upper portion of the discharge chamber.

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Attorney Docket No.: PET-1005 PCT

In re Application of:

PETRECO INTERNATIONAL LIMITED

International Application No.: PCT/US02/35757

International Filing Date: 7 November 2002

Title: Dual-Cell Mechanical Flotation System With Intermittent Skimming

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**APPOINTMENT OF SUB-AGENT**

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Sir:

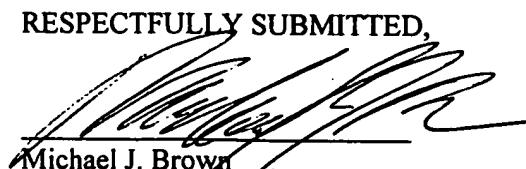
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as sub-agents for the individual applicant in the above-identified international application.

RESPECTFULLY SUBMITTED,

  
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